

# **TOXICOLOGICAL PROFILE FOR ZINC**

**U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Public Health Service  
Agency for Toxic Substances and Disease Registry**

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## **DISCLAIMER**

The use of company or product name(s) is for identification only and does not imply endorsement by the Agency for Toxic Substances and Disease Registry.

## **UPDATE STATEMENT**

A Toxicological Profile for Zinc was released on December 1990. This edition supersedes any previously released draft or final profile.

Toxicological profiles are revised and republished as necessary, but no less than once every three years. For information regarding the update status of previously released profiles, contact ATSDR at:

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## FOREWORD

The Superfund Amendments and Reauthorization Act (SARA) of 1986 (Public Law 99-499) extended and amended the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund). This public law directed the Agency for Toxic Substances and Disease Registry (ATSDR) to prepare toxicological profiles for hazardous substances most commonly found at facilities on the CERCLA National Priorities List and that pose the most significant potential threat to human health, as determined by ATSDR and the Environmental Protection Agency (EPA). The revised list of the 275 most hazardous substances was published in the Federal Register on October 28, 1992 (57 FR 48801). For prior versions of the list of substances, see Federal Register notices dated April 17, 1987 (52 FR 12866); October 20, 1988 (53 FR 41280); October 26, 1989 (54 FR 43619); October 17, 1990 (55 FR 42067); and October 17, 1991 (56 FR 52166).

Section 104(i)(3) of CERCLA, as amended, directs the Administrator of ATSDR to prepare a toxicological profile for each substance on the list. Each profile must include the following:

- (A) The examination, summary, and interpretation of available toxicological information and epidemiological evaluations on a hazardous substance in order to ascertain the levels of significant human exposure for the substance and the associated acute, subacute, and chronic health effects.
- (B) A determination of whether adequate information on the health effects of each substance is available or in the process of development to determine levels of exposure that present a significant risk to human health of acute, subacute, and chronic health effects.
- (C) Where appropriate, identification of toxicological testing needed to identify the types or levels of exposure that may present significant risk of adverse health effects in humans.

This toxicological profile is prepared in accordance with guidelines developed by ATSDR and EPA. The original guidelines were published in the Federal Register on April 17, 1987. Each profile will be revised and republished as necessary.

The ATSDR toxicological profile is intended to succinctly characterize the toxicological and adverse health effects information for the hazardous substance being described. Each profile identifies and reviews the key literature (that has been peer-reviewed) that describes a hazardous substance's toxicological properties. Other pertinent literature is also presented, but described in less detail than the key studies. The profile is not intended to be an exhaustive document; however, more comprehensive sources of specialty information are referenced.

Each toxicological profile begins with a public health statement, that describes in nontechnical language, a substance's relevant toxicological properties. Following the public health statement is information concerning levels of significant human exposure and, where known, significant health effects. The adequacy of information to determine a substance's health effects is described in a health effects summary. Data needs that are of significance to protect public health will be identified by ATSDR and EPA. The focus of the profiles is on health and toxicological information; therefore, we have included this information in the beginning of the document.

***Foreword***

The principal audiences for the toxicological profiles are health professionals at the federal, state, and local levels, interested private sector organizations and groups, and members of the public.

This profile reflects our assessment of all relevant toxicological testing and information that has been peer reviewed. It has been reviewed by scientists from ATSDR, the Centers for Disease Control and Prevention (CDC), and other federal agencies. It has also been reviewed by a panel of nongovernment peer reviewers and was made available for public review. Final responsibility for the contents and views expressed in this toxicological profile resides with ATSDR.

A handwritten signature in black ink, appearing to read 'David Satcher', with a long horizontal line extending to the right.

David Satcher, M.D., Ph.D.  
Administrator  
Agency for Toxic Substances and  
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### THE PROFILE HAS UNDERGONE THE FOLLOWING ATSDR INTERNAL REVIEWS:

1. Green Border Review. Green Border review assures the consistency with ATSDR policy.
2. Health Effects Review. The Health Effects Review Committee examines the health effects chapter of each profile for consistency and accuracy in interpreting health effects and classifying endpoints.
3. Minimal Risk Level Review. The Minimal Risk Level Workgroup considers issues relevant to substance-specific minimal risk levels (MRLs), reviews the health effects database of each profile, and makes recommendations for derivation of MRLs.
4. Quality Assurance Reviews. The Quality Assurance Branch assures that consistency across profiles is maintained, identifies any significant problems in format or content, and establishes that Guidance has been followed.





## PEER REVIEW

*A peer review panel was assembled for zinc. The panel consisted of the following members:*

1. Dr. Martin Alexander, Professor, Soil Microbiology, Dept. of Soil, Crop, and Atmospheric Sciences, Cornell University, Ithaca, New York
2. Dr. Ernest Foulkes, Deputy Director, Department of Environmental Health, University of Cincinnati, College of Medicine, Cincinnati, Ohio
3. Dr. Ingeborg Harding-Barlow, Private Consultant, Palo Alto, California.

These experts collectively have knowledge of zinc's physical and chemical properties, toxicokinetics, key health end points, mechanisms of action, human and animal exposure, and quantification of risk to humans. All reviewers were selected in conformity with the conditions for peer review specified in Section 104(i)(13) of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended.

Scientists from the Agency for Toxic Substances and Disease Registry (ATSDR) have reviewed the peer reviewers' comments and determined which comments will be included in the profile. A listing of the peer reviewers' comments not incorporated in the profile, with a brief explanation of the rationale for their exclusion, exists as part of the administrative record for this compound. A list of databases reviewed and a list of unpublished documents cited are also included in the administrative record.

The citation of the peer review panel should not be understood to imply its approval of the profile's final content. The responsibility for the content of this profile lies with the ATSDR.



## CONTENTS

FOREWORD .....	v
CONTRIBUTORS .....	vii
PEER REVIEW .....	ix
LIST OF FIGURES .....	xv
LIST OF TABLES .....	xvii
 1. PUBLIC HEALTH STATEMENT .....	 1
1.1 WHAT IS ZINC? .....	1
1.2 WHAT HAPPENS TO ZINC WHEN IT ENTERS THE ENVIRONMENT? .....	2
1.3 HOW MIGHT I BE EXPOSED TO ZINC? .....	3
1.4 HOW CAN ZINC ENTER AND LEAVE MY BODY? .....	4
1.5 HOW CAN ZINC AFFECT MY HEALTH? .....	5
1.6 IS THERE A MEDICAL TEST TO DETERMINE WHETHER I HAVE BEEN EXPOSED TO ZINC? .....	6
1.7 WHAT RECOMMENDATIONS HAS THE FEDERAL GOVERNMENT MADE TO PROTECT HUMAN HEALTH? .....	6
1.8 WHERE CAN I GET MORE INFORMATION? .....	7
 2. HEALTH EFFECTS .....	 9
2.1 INTRODUCTION .....	9
2.2 DISCUSSION OF HEALTH EFFECTS BY ROUTE OF EXPOSURE .....	10
2.2.1 Inhalation Exposure .....	11
2.2.1.1 Death .....	11
2.2.1.2 Systemic Effects .....	15
2.2.1.3 Immunological Effects .....	23
2.2.1.4 Neurological Effects .....	24
2.2.1.5 Reproductive Effects .....	24
2.2.1.6 Developmental Effects .....	24
2.2.1.7 Genotoxic Effects .....	25
2.2.1.8 Cancer .....	25
2.2.2 Oral Exposure .....	26
2.2.2.1 Death .....	26
2.2.2.2 Systemic Effects .....	27
2.2.2.3 Immunological Effects .....	47
2.2.2.4 Neurological Effects .....	48
2.2.2.5 Reproductive Effects .....	48
2.2.2.6 Developmental Effects .....	49
2.2.2.7 Genotoxic Effects .....	51
2.2.2.8 Cancer .....	51
2.2.3 Dermal Exposure .....	52
2.2.3.1 Death .....	52
2.2.3.2 Systemic Effects .....	52
2.2.3.3 Immunological Effects .....	56
2.2.3.4 Neurological Effects .....	56

2.2.3.5	Reproductive Effects	56
2.2.3.6	Developmental Effects	56
2.2.3.7	Genotoxic Effects	56
2.2.3.8	Cancer	56
2.3	TOXICOKINETICS	56
2.3.1	Absorption	57
2.3.1.1	Inhalation Exposure	57
2.3.1.2	Oral Exposure	58
2.3.1.3	Dermal Exposure	60
2.3.2	Distribution	61
2.3.2.1	Inhalation Exposure	62
2.3.2.2	Oral Exposure	63
2.3.2.3	Dermal Exposure	63
2.3.3	Metabolism	63
2.3.4	Excretion	64
2.3.4.1	Inhalation Exposure	64
2.3.4.2	Oral Exposure	64
2.3.4.3	Dermal Exposure	65
2.3.5	Mechanisms of Action	65
2.4	RELEVANCE TO PUBLIC HEALTH	67
2.5	BIOMARKERS OF EXPOSURE AND EFFECT	83
2.5.1	Biomarkers Used to Identify or Quantify Exposure to Zinc	84
2.5.2	Biomarkers Used to Characterize Effects Caused by Zinc	84
2.6	INTERACTIONS WITH OTHER CHEMICALS	86
2.7	POPULATIONS THAT ARE UNUSUALLY SUSCEPTIBLE	89
2.8	METHODS FOR REDUCING TOXIC EFFECTS	90
2.8.1	Reducing Peak Absorption Following Exposure	91
2.8.2	Reducing Body Burden	91
2.8.3	Interfering with the Mechanism of Action for Toxic Effects	92
2.9	ADEQUACY OF THE DATABASE	93
2.9.1	Existing Information on Health Effects of Zinc	93
2.9.2	Identification of Data Needs	96
2.9.3	On-going Studies	104
3.	CHEMICAL AND PHYSICAL INFORMATION	105
3.1	CHEMICAL IDENTITY	105
3.2	PHYSICAL AND CHEMICAL PROPERTIES	105
4.	PRODUCTION, IMPORT/EXPORT, USE, AND DISPOSAL	111
4.1	PRODUCTION	111
4.2	IMPORT/EXPORT	113
4.3	USE	113
4.4	DISPOSAL	114
5.	POTENTIAL FOR HUMAN EXPOSURE	115
5.1	OVERVIEW	115
5.2.1	Air	118
5.2.2	Water	118
5.2.3	Soil	122
5.3	ENVIRONMENTAL FATE	122
5.3.1	Transport and Partitioning	123

5.3.2	Transformation and Degradation .....	128
5.3.2.1	Air .....	128
5.3.2.2	Water .....	128
5.3.2.3	Sediment and Soil .....	129
5.4	LEVELS MONITORED OR ESTIMATED IN THE ENVIRONMENT .....	130
5.4.1	Air .....	130
5.4.2	Water .....	131
5.4.3	Sediment and Soil .....	132
5.4.4	Other Environmental Media .....	134
5.5	GENERAL POPULATION AND OCCUPATIONAL EXPOSURE .....	134
5.6	POPULATIONS WITH POTENTIALLY HIGH EXPOSURES .....	138
5.7	ADEQUACY OF THE DATABASE .....	138
5.7.1	Identification of Data Needs .....	139
5.7.2	On-going Studies .....	142
6.	ANALYTICAL METHODS .....	143
6.1	BIOLOGICAL MATERIALS .....	143
6.2	ENVIRONMENTAL SAMPLES .....	151
6.3	ADEQUACY OF THE DATABASE .....	157
6.3.1	Identification of Data Needs .....	158
6.3.2	On-going Studies .....	159
7.	REGULATIONS AND ADVISORIES .....	161
8.	REFERENCES .....	173
9.	GLOSSARY .....	227
APPENDICES		
A.	USER'S GUIDE .....	A-1
B.	ACRONYMS, ABBREVIATIONS, AND SYMBOLS .....	B-1



## LIST OF FIGURES

2-1 Levels of Significant Exposure to Zinc - Inhalation .....	14
2-2 Levels of Significant Exposure to Zinc - Oral .....	36
2-3 Existing Information on Health Effects of Zinc .....	95
5-1 Frequency of NPL Sites With Zinc Contamination (Fume or Dust) .....	117





## LIST OF TABLES

2-1 Levels of Significant Exposure to Zinc - Inhalation .....	12
2-2 Levels of Significant Exposure to Zinc - Oral .....	28
2-3 Levels of Significant Exposure to Zinc - Dermal .....	53
2-4 Genotoxicity of Zinc <i>In Vivo</i> .....	80
2-5 Genotoxicity of Zinc <i>In Vitro</i> .....	82
3-1 Chemical Identity of Zinc and Selected Compounds .....	106
3-2 Physical and Chemical Properties of Zinc and Selected Compounds .....	108
4-1 Facilities That Manufacture or Process Zinc (Fume or Dust) .....	112
5-1 Releases to the Environment from Facilities That Manufacture or Process Zinc (Fume or Dust) .....	119
6-1 Analytical Methods for Determining Zinc in Biological Materials .....	144
6-2 Analytical Methods For Determining Zinc in Environmental Samples .....	152
7-1 Regulations and Guidelines Applicable to Zinc .....	162